Software Processes and Management

Subject Notes for SWEN90016

The Department of Computing
and
Information Systems

The University of Melbourne
Semester 1, 2017

Subject Profile

Aims

The aim of this subject is for students to learn the fundamentals of software development processes and project management. The subject covers the basic theories, techniques, methods and tools used in modern software development. The specific learning outcomes are:

1. Select appropriate software engineering/development processes and practices for specific software engineering projects

2. Manage team dynamics and professional communication

3. Plan and manage projects

4. Identify risks and modify project activities to mitigate these risks

5. Manage software project activities to ensure a quality product

6. Describe human and organisational implications of change and explain the organisational change process.

Pre-conditions

These preconditions constitute the knowledge assumed by the subject and the knowledge and skills required to understand and build upon the subject material. Although the handbook for does not specify particular subjects as prerequisites, the following background knowledge is assumed.

1. Experience with object-oriented design and specifically with detailed designs expressed in UML 2.0. This is to be gained from SWEN20003, Object Oriented Software Development, or equivalent subjects.

2. Experience with requirements analysis, and programming from architectural and detailed designs. This is to be gained from SWEN30006 or equivalent subjects.

Post-conditions

The subject forms a prerequisite for three master's level subjects: Software Design and Architecture, High Integrity Systems and Masters Software Engineering Project and Masters Advanced Software Engineering Project.
Upon completion of this subject, students should know the following about software development:

1. Students must know the difference between "systematic" and "ad-hoc" development. Students must have a working knowledge of the software development process.

2. Students must know the phases of the software development life-cycle, the inputs and outputs of those phases, the standard methods, techniques and tools used in those phases, and the limits of those tools, techniques and methods.

3. Students must know how to use analysis to derive a project plan. Students must know the phases of systems analysis, the range metrics and the means of checking systems analysis.

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4. Students must know the fundamentals of project management, what constitutes project management, and the tools, techniques and methods of project management.

Subject Outline

Part I: Introduction.

>   **Topic 1:** An introduction to software engineering/development.
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>   **Topic 2:** An introduction to process and project management.

Part II: The controlling disciplines.

>   **Topic 3:** Processes.
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>   **Topic 4:** Governance, Teams, People, and Human Resources.
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>   **Topic 5:** Planning and Scheduling.
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>   **Topic 6:** Configuration Management.

Part III: The monitoring disciplines.

>   **Topic 7:** Metrics, Cost and Effort Estimation.
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>   **Topic 8:** Risk.
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>   **Topic 9:** Quality Assurance.

Generic Skills

The subject is a technical subject. The aim is to explore the various approaches to building software with specific attributes into a system.

The subject will also aim to to develop a number of *generic skills*.

- We encourage *independent research* in order to develop your ability to learn independently, assess what you learn, and apply what you learn.

- We will be conducting the projects in teams which will, of course, require *teamwork*. While not the primary goal of the project, you are expected to be disciplined in your approach to the projects by requiring that rigorous processes be followed and that you meet certain milestones along the way.

- You will also be developing experience at empirical software engineering, and the interpretation and assessment of quantitative and qualitative data.

- Finally, and perhaps most importantly, you will be encouraged to develop critical analysis skills that will complement and round what you have learned so far in your degree.

Expectations on Students

The subject contacts hours consist of two weekly, one-hour lectures, and one weekly tutorial/workshops. In addition, there also consultation times that will be announced in week 2.

Lectures and Lecture Notes

These subject notes are the main reference for the subject. These notes will be available on LMS, along with some additional reading. They contain notes on all of the major topics contained in the subject.

Students are expected to read the subject notes and additional readings.

Lectures are aimed at providing students with another view of the material in the subject notes. Lectures will primarily consist of discussions, so it is expected that students will gain a deeper understanding of concepts and material from lectures than from the lecture notes.

Students are expected to attend lectures.

Material from other subjects such as Object Oriented Software (or equivalent) Development and Algorithms and Data Structures (or equivalent) is assumed in much of the subject notes, workshops, assigments, and exam questions.

Students are expected to be familiar with the major topics from these subjects.

Tutorials/Workshops

Workshops are intended to take concepts and principles discussed in lectures and to apply them to realistic examples. There will be two example projects used throughout this subject. Both example projects were developed by large teams, and were considered a success by their clients.

Students are expected to actively engage in workshops by conducting workshop exercises and in engaging in the discussions.

LMS

The LMS will be used to post assignment and workshop sheets, and to post announcements regarding the subject. The subject staff will monitor the discussion board. Questions regarding assignments and workshops should be posted to the message board on the LMS; unless those questions require you to post part of your solution, in which case, please contact one of the subject staff directly.

Students are expected to read the announcements on the LMS on a daily basis.

咨询

Consultations

Consultations are for students to ask questions about assessment work or to seek a deeper understanding of the subject material. Students are encouraged to come to consultations when having difficulty with the subject matter or the assessment work. Consultations hours will be announced in week 2, and will be posted on the LMS

Assessment

This subject, is a blend [混合] of theory and practice. The assessment requires students to demonstrate both knowledge and application.

Assignments and the project

The assessment is 50% assignment/project work and 50% examination. The assessment will be in the form of one individual assignment and one group project.

- The individual assignment is worth worth 20%, and is expected to take 20-30 hours of work.

- The project is worth 30%, will be undertaken as a group of 3-4 students, requiring approximately 30-40 hours per student and will be assessed as a team exercise.

What we are looking for in assessments is understanding of theory and its practical application.

In short — we give marks if you show thinking.

Examination

The examination is a 2 hour exam based on the lecture, workshop and assignment material. The workshop exercises are written in the same style and of similar difficulty to the exam questions. Being able to answer the assignment questions, workshop exercises, and project work means that you will be well prepared for the exam.

Plagiarism and Collusion [剽窃 共谋]

With the exception of the group project, all assessment items are individual, and submissions must be entirely the work of the person submitting them. This is in accordance with the university policy on academic honesty and plagiarism (see `http://academichonesty.unimelb.edu.au/policy.html`). Even if you discuss the assignments with another student you are obliged to ensure that all work that you submit for assessment purposes is your independent work. All students should familiarise themselves with the procedures that must be followed if plagiarism or collusion is detected, and the penalties that must be applied — they are quite harsh.

Assessment hurdles

To pass the subject, students *must* achieve a 50% hurdle in coursework and the exam. A failure to reach either hurdle will result in a "hurdle failure" marks. Failure to reach 50% overall will result in outright failure.

Assessment Component	Percentage of Total	Hurdle
Assignments/project	50%	25%
Final Examination	50%	25%

Staff Details

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